

Inductive Sensors

Single Loop Detector

Type LD with teach-in

CARLO GAVAZZI



- Single loop detector
- Automatic adjustment of detection level
- Manual sensitivity for compensations of variations
- Easy installation via 11 pin circular plug
- Rated operational voltage: 24 VAC/DC, 115 VAC or 230 VAC
- Pulse or presence relay output
- Output 1A/250 VAC SPDT relay
- LED indication for power, relay status and loop fault
- Sensitivity boost – only LDP1
- Selectable frequency – prevents cross-talk

Product Description

Loop detectors for detection of vehicles. The vehicle loop detector is designed to handle all parking, drive-through and access control applications for controlling doors, gates, barriers or fences.

The principle is based on a change in the inductance within the loop when a metallic object (vehicles) is passing. The microprocessor evaluates the changes.

Ordering Key

LDP1 SA1 B 230-2

Type _____
 Plug mounting _____
 Loop inputs _____
 Function _____
 Adjustment _____
 Outputs _____
 Relay versions _____
 Power supply _____

Type Selection

Mounting	Relay	Ordering no. Supply: 24 VAC/DC	Ordering no. Supply: 115 VAC	Ordering no. Supply: 230 VAC
Single loop	SPDT	LDP1SA1BM24-2	LDP1SA1B115-2	LDP1SA1B230-2

Specifications

Rated operational voltage (U_B)		Frequency range	
Pin 2 & 9	230	13 - 120 kHz	
	115	Loop inductance	
	M24	15 - 1500 µH	
Rated insulation voltage	<2.0 kVAC (rms)	Operating frequency (f)	
Rated impulse withstand voltage	4 kV (1.2/50 µs) (line/neutral)	Relay output	
Rated operational power		Response time	
AC supply	3 VA	400 mS	
AC/DC supply	1.5 VA / 1.5 W	Environment	
Power on delay (t_v)		Overvoltage category	
< 10 sec Typ. 4 sec		Degree of protection	
Outputs		Pollution degree	
Minimum switching current	10 mA @ 12 V	Temperature	
Rated insulation voltage	250 VAC (rms) (cont./elec.)	Operating	
Relay Rating (AgNi 90/10)		Storage	
Resistive loads	AC1	Housing material	
	DC1	NORYL SE1, light grey	
Mechanical life (typical)	≥ 15 x 10 ⁶ operations	Weight	
Electrical life (typical)	AC1	AC supply	
		AC/DC supply	
Sensitivity		Approvals	
8 sensitivity settings available		UL508, CSA	
		CE marking	
		Yes	



Mode of Operation

Application

The LDP Vehicle Loop Detector is based on micro-processor technology, which has enable a large number of functions to be implemented. The functions is primarily for use in the Parking/Access Control Industry like control for gates, barriers, fence,s etc. Standard operations is implemented including programmable pulse and presence option.

Principle

The Vehicle Loop Detector is based on the inductive principle, using a coil of wire buried in the driveway and connected to the loop detector. The change in inductance will be measured as a change in frequency. The output relay activates, when the loop is activated and releases again when the loop returns to a non-activated condition.

Setup

The loop has to be in a passive condition (no object in the loop area) during start-up and adjustment. The loop detector will automatically calibrate when the reset button has been activated, which will be indicated by the red LED flashing. The functioning can now be checked by activating the loop with the actual object. Now the yellow LED will go on, and the output relay will be activated according to the dip-switch settings.

If the loop detector does not react, the sensitivity must be manual adjusted by means of the dip-switches. **Important:** reset the system after changing the Dip-switch settings.

Temperature compensation
The frequency will increase as a result of decreasing temperatures and vice versa. To compensate for this, or any other situation that courses slowly change in frequency, the LD auto tunes constantly. That means if the frequency changes slowly there will be no detection. The auto tune function compensates for both increasing or decreasing in frequency.

Fault detection
This function is useful if the cable disconnect. The alarm will be indicated via the red LED in front of the housing. This LED is constantly lighting when the loop is open or to large and flashing when a short circuit occurs or a loop is to small.

Sensitivity
8 sensitivity settings are available on the dip-switch-

es in front of the module, to allow flexibility in configuration and application (Compensation for variation in loop construction).

Reset switch
The reset switch enables the detector to be manually reset during commissioning and testing. The detector will re-tune the sensing loop and becoming ready for vehicle detection.

Relay output
The single loop detector has two SPDT relays – one for pulse output and one for presence output. Pulse output (one shot): It is possible to select the length of the output period to 0.2s or 1 second. The pulse output can be setup to activate on detection of a vehicle or when the vehicle leaves the loop. Presence output: The output will be activated as long as there is a vehicle parked in the loop. It will be possible to activate a filter (ON-delay of 2 seconds), which prevents a false detection from a small or fast moving object.

Pulse output mode
The relay activates only for a short periode when the vehicle enters or leaves the loop.

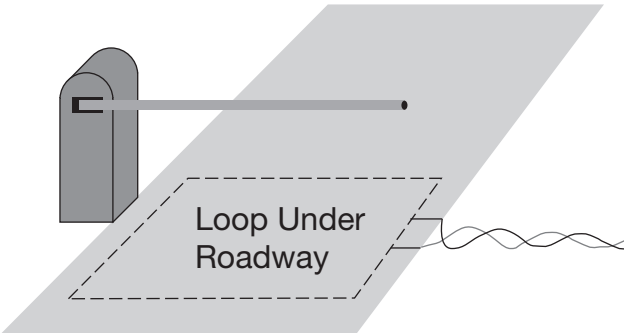
Permanent output mode
The relay will remain active as long as there is a vehicle parked in the loop.

Pulse length
Extends the pulse length from 0.2 sec to 1 sec.

On-delay
Prevents false detections of small or fast moving objects.

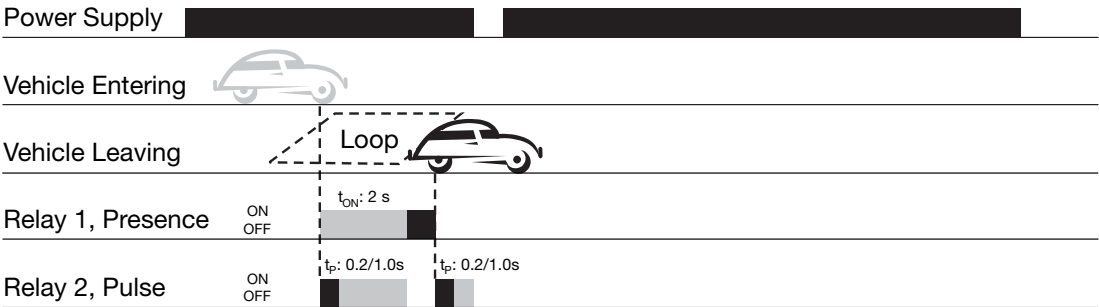
Sense boost
This feature sets the undetected level to maximum sensitivity and is used to prevent loss of detection of high-bed vehicles.

Selectable frequency
The frequency of the loop is determined by the inductance of the loop and the frequency switch setting. If the frequency switch is on, the frequency is reduced. It may be necessary to change the frequency to prevent cross talk between adjacent loops. The frequency function will only change the frequency of one channel of the dual loop detector. **Important:** Be carefully when installing the detector next to another inductive load, as this can have an effect on the detector and cause false detections.

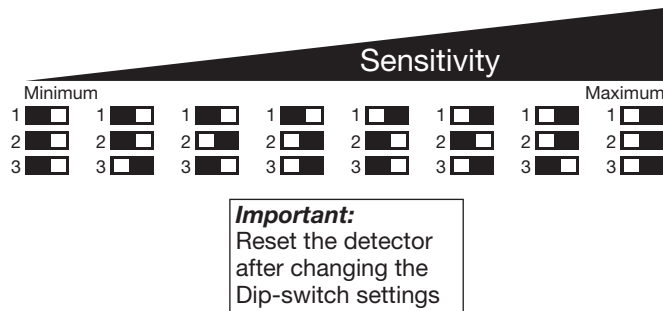


Operation Diagram

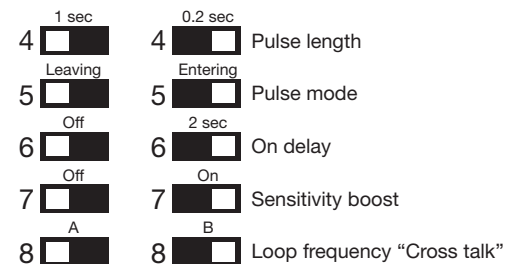
LDP1 / Presence and Pulse mode



Dip Switch Settings



LDP1-2



Loop Diagram

Loop installation

The loop geometry must be adapted to the respective application. The setup will be optimal if the loop has the same size as the object to be detected.

After determining the loop geometry, a groove must be cut in the ground for installing the loop.

Cut an inclined groove of 45° angle at the corners of the loop, which will protect it from excessive wear.

Clean the groove for moisture and place the wire as tight as possible along the bottom of the groove.

Before sealing up the groove, it is recommendable to check the loop inductance using a measuring device. Optimum value: 80-300 μ H.

When sealing up the groove, ensure that the temperature of the sealing compound does not exceed the max temperature of the loop insulation, as this might cause an earth fault.

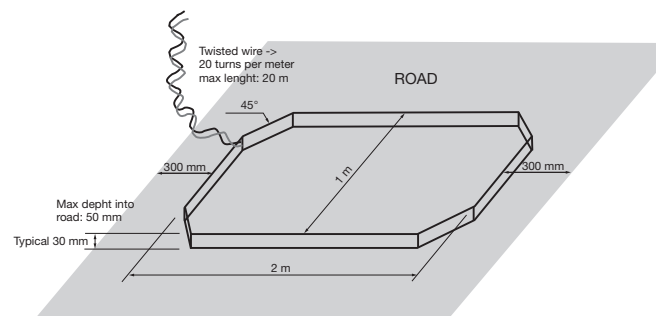
Loop turns

The number of turns strongly depends on the circumference of the loop. The smaller the loop, the more turns are required.

Cable Recommendations

- Use 1.5mm squared cable.
- Use silicon coated cable, if placed directly into the ground
- Use 2m of spacing between two adjacent loops.
- Use screened feeder cable in electrically noisy environments or where feeder runs parallel to power cables.

Loop circumference (m)	No. of turns
>10	2
6-10	3
<6	4

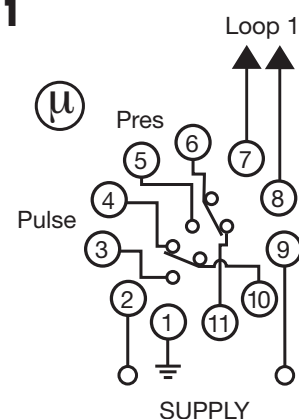


Pin configuration

Pin n.	Single Channel Detector
1	Earth
2	Supply
3	Pulse relay NO
4	Pulse relay NC
5	Presence relay NO
6	Presence relay COM
7	Loop
8	Loop
9	Supply
10	Pulse relay COM
11	Presence relay NC

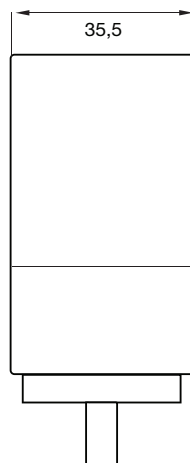
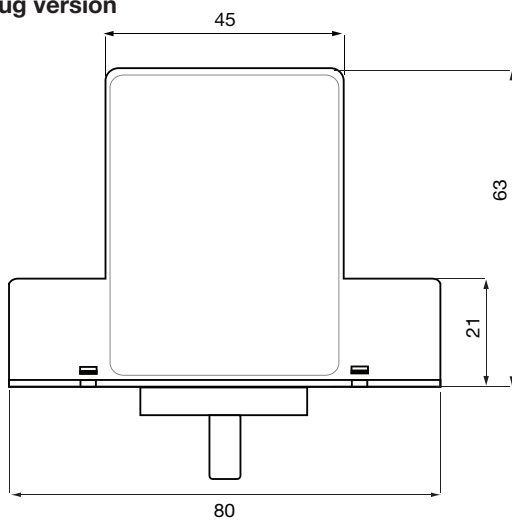
Wiring Diagram

LDP1



Dimension Drawing

Plug version



Accessories

- 11 pole corcular socket ZPD11

Delivery Contents

- Detector
- Packaging: Carton box